REMARKS

Applicants greatly appreciate the withdrawal of the Final Official Action dated February 22, 2006, and subsequent issuance of the present Official Action (hereinafter "the Official Action"). Applicants note that the Official Action includes new grounds of rejection based on Hong's publication date of January 16, 2003. Applicants also note the new rejections based on various other references.

In response, Applicants provide herewith a Statement of Accuracy of Translation of the Korean application to perfect the claim for foreign priority based on the filing date of the Korean application of December 11, 2002. Accordingly Hong has been removed as a reference as the present application's foreign priority date predates the publication date of Hong.

With regard to the new rejections based upon other references, Applicants respectfully submit that even if the cited references were combined the combination would still not disclose or suggest the recitations of the pending claims. Further, there is no clear and particular evidence of a motivation or suggestion to combine these references as required under Section 103. Accordingly, Applicants respectfully submit that all pending claims are patentable over the cited references for at least the reasons described herein.

Hong Is Not Prior Art Under Section 102(a).

Various of the pending claims stand rejected under 35 U.S.C. § 103 over several combinations of references including U.S. Patent Publication No. 2003/0013272 by Hong ("Hong"). *Official Action, page 2.* Contrary to assertions in the Official Action, Hong is not prior art under Section 102(a) as the Korean priority application was filed December 11, 2002, which is before January 16, 2003 (*i.e.*, the publication date of Hong). Therefore, Hong cannot be used in a rejection under Section 103 because the present invention and Hong were commonly owed by Samsung Electronics Company, Ltd. at the time that the present invention was made pursuant to Section 103(c). In support, Applicants provide herewith a statement of

accuracy of translation of the Korean priority application, thereby perfecting Applicants' claim for priority of the Korean application.[1]

Independent Claims 9 And 16 Are Patentable Over Knorr And Chen.

Claims 4, 9, 10, 11, 12, 15 and 16 stand rejected under 35 U.S.C. § 103 over U.S. Patent No. 6,531,377 to Knorr et al. ("Knorr") in view of U.S. Patent No. 6,265,269 to Chen et al.("Chen"). *Official Action, page 7.* Applicants respectfully traverse the rejections based on Knorr and Chen as even if these references were combined, the combination would not disclose or suggest all of the recitations of the pending claims and, further, there is no clear and particular evidence of a motivation or suggestion to combine these references as required under Section 103.

Independent Claim 9 recites in part:

> forming a pattern to define a gap on a substrate;
> forming a bottom oxide layer on a surface of the substrate and substantially filling the gap; etching back the bottom oxide layer inside an opening in the gap to expose side walls of the gap **so that a residual bottom oxide layer remains only at a bottom of the gap**; and
> **selectively growing a top oxide layer on the residual bottom oxide layer**.

Independent Claim 16 includes similar recitations to the recitations highlighted above.

To establish a *prima facie* case of obviousness, the alleged combination of references must disclose or suggest **all** the recitations of the claims. Applicants respectfully submit that even if Knorr and Chen were combined, the combination would not disclose or suggest, at least, the above-highlighted recitations. For example, Knorr does not disclose or suggest "selectively growing a top oxide layer on the residual bottom oxide layer." In particular, column 4, line 64 – Column 9, line 9 of Knorr, reads that a high density plasma chemical vapor deposition (HDP-CVD) process is used to deposit the second insulating material 126 as shown in Figure 5 therein. In contrast to Knorr, the independent claims recite "selectively growing a top oxide layer on the... bottom oxide layer," which Applicants respectfully submit is not

[1] Applicants note that the reliance upon Section 103(c) to remove Hong as a reference is not an admission that the present claims are unpatentable over a combination of Hong and the remaining references.

disclosed by an HCP-CVD process as, in some embodiments according to the invention, the selective growth is provided via a reaction with the base material (i.e., the bottom oxide layer), not by depositing material as is done with an HCP-CVD process. In other words, the deposition of Knorr does not disclose or suggest "selectively growing" as recited in independent Claims 9 and 16 as simply depositing material using HCP-CVD is not selective.

Applicants further submit that Chen does not disclose or suggest the recitations shown above to be missing from Knorr. In particular, Figures 1-5 show a process of forming a silicon oxide layer 130 in a trench. However, Chen says nothing about selectively growing a top oxide layer on a residual bottom oxide layer. In fact, Chen discusses forming the silicon oxide layer 130 in the trench so that a trench power MOS device can be formed in the trench A. Accordingly, Chen discusses forming a device in the trench on the silicon oxide layer 130 not selectively growing a top oxide layer on the bottom oxide layer as recited in independent Claims 9 and 16. Accordingly, even if Knorr and Chen were combined, the combination would not disclose or suggest at least the recitations discussed above.

To further support a *prima facie* case of obviousness, there must also be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and there must be a reasonable expectation of success of the combination. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. See MPEP § 2143. As stated by the Court of Appeals for the Federal Circuit, to support combining references in a § 103 rejection, evidence of a suggestion, teaching, or motivation to combine must be clear and particular, and this requirement is not met by merely offering broad, conclusory statements about teachings of references. *In re Dembiczak*, 50 USPQ2.d 1614, 1617 (Fed. Cir. 1999). Applicants respectfully submit that there is no clear and particular evidence of a motivation or suggestion to combine Knorr and Chen as required under Section 103.

Knorr deals with problems associated with filling high aspect ratio trenches:

> A problem in prior art isolation techniques is the formation of these voids 20 in high-aspect ratio trenches. Aggressive aspect

> ratios in DRAM devices are approaching 4:1 and greater. The gap fill requirement is a function of ground rule layout and critical dimension (CD) tolerances, for example. *Knorr, Column 2, lines 29-24.*

As shown above, Knorr is intended to address voids that can be formed in high aspect ratio trenches.

In contrast, Chen deals with the particular shape of an oxide layer in a trench for a power MOS device to reduce leakage current:

> Therefore, what is needed is to form a bottom oxide layer having a concave surface and the bottom oxide layer is served as an insulating layer of a trench power MOS device. *Chen, Column 1, lines 65-68.*

As shown above, Chen addresses the shape of the oxide layer in the trench that is used as a basis for a trench power MOS device, but says nothing about voids. In fact, much of Chen actually promotes the generation of overhang portions (as shown in Figure 2 of Chen) to provide the desired concave shape of the oxide layer 130 shown in Figure 5. Applicants respectfully point out that it is this type of overhang that can lead to the types of voids described in Knorr and Applicants' background (especially in high aspect ratio trenches). Accordingly, there is no clear and particular evidence of a motivation or suggestion to combine these references when Chen calls for the formation of overhangs that may actually cause the voids which Knorr seeks to avoid.

Accordingly, independent Claims 9 and 16 are patentable over Knorr and Chen for at least the reasons described above. Furthermore, dependent Claims 4-8 and 10-15 are patentable at least per the patentability of the independent claims from which these claims depend.

CONCLUSION

Applicants have provided herewith a Statement of Accuracy of Translation for the Korean priority application to which the present application claims priority, thereby removing Hong as a reference under Section 103. Applicants have also shown that even if Knorr and Chen were combined, the combination would not disclose or suggest at least "selectively growing a top oxide layer on the... bottom

oxide layer" as recited in independent Claims 9 and 16. Furthermore, Applicants have also shown that there is no clear and particular evidence of a motivation or suggestion to combine Knorr and Chen as Chen actually calls for the creation of structures which can lead to the problems (*i.e.*, voids) which Knorr addresses. Accordingly, Applicants respectfully request the withdrawal of all rejections and the allowance of all claims in due course. If any informal matters should arise, Applicants are encouraged to contact the undersigned by telephone at (919) 854-1400.

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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on August 29, 2006.

Audra Wooten